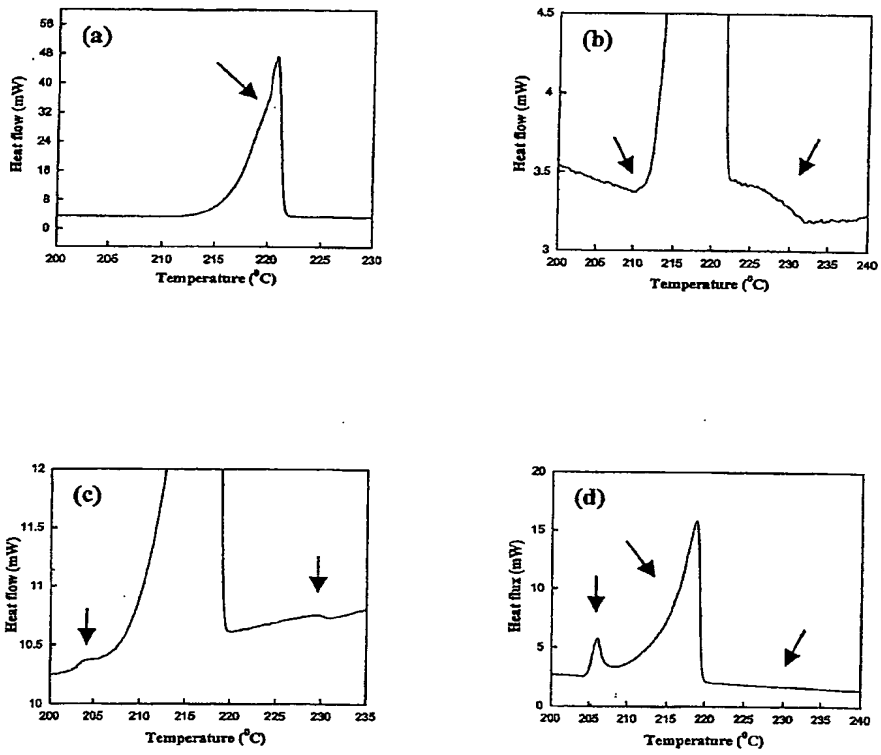

(a)
Heat flow (mW)
Temperature (°C)
(b)
Heat flow (mW)
Temperature (°C)
(c)
Heat flow (mW)
Temperature (°C)
(d)
Heat flux (mW)
Temperature (°C)

Figure 1.

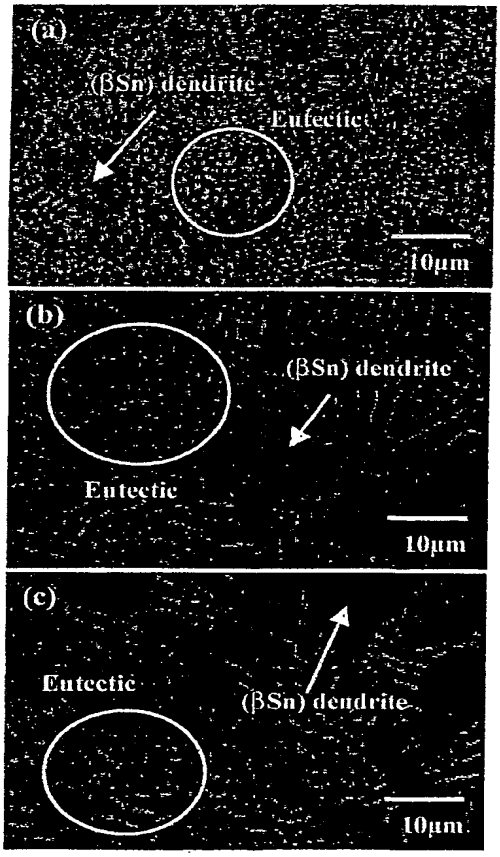

(a)
(βSn) dendrite
Eutectic
10μm
(b)
(βSn) dendrite
Eutectic
10μm
(c)
Eutectic
(βSn) dendrite
10μm

Figure 2.

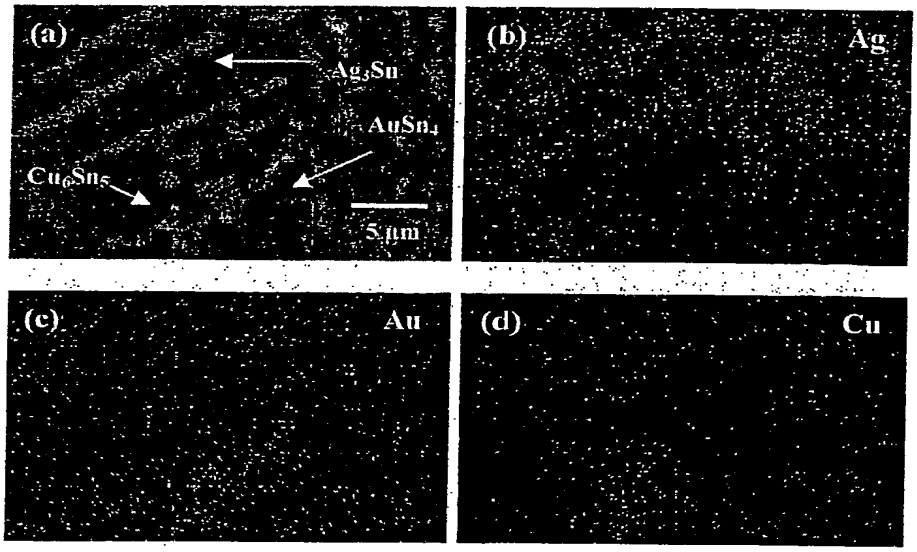


Figure 3.

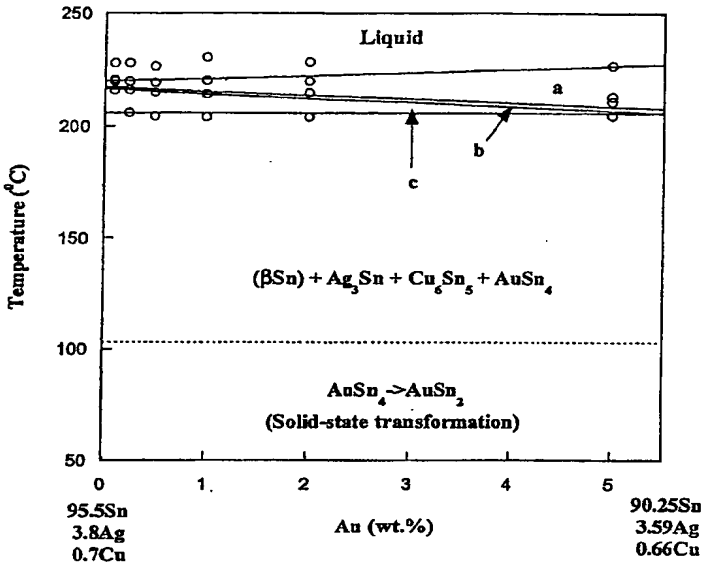

250
200
150
100
50
Liquid
a
b
c
(βSn) + Ag3Sn + Cu6Sn5 + AuSn4
AuSn4 ->AuSn2
(Solid-state transformation)
Temperature (°C)
0
1
2
3
4
5
95.5Sn
3.8Ag
0.7Cu
Au (wt.%)
90.25Sn
3.59Ag
0.66Cu

Figure 4.

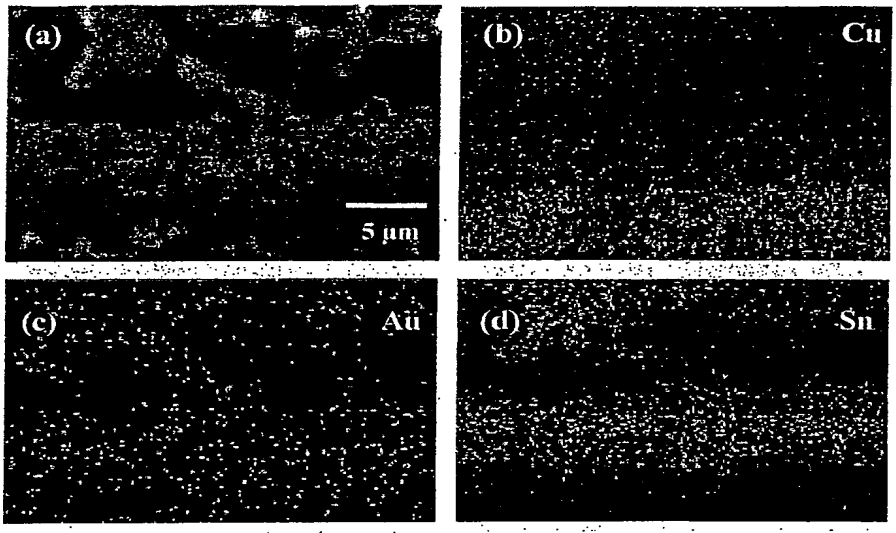


Figure 5.

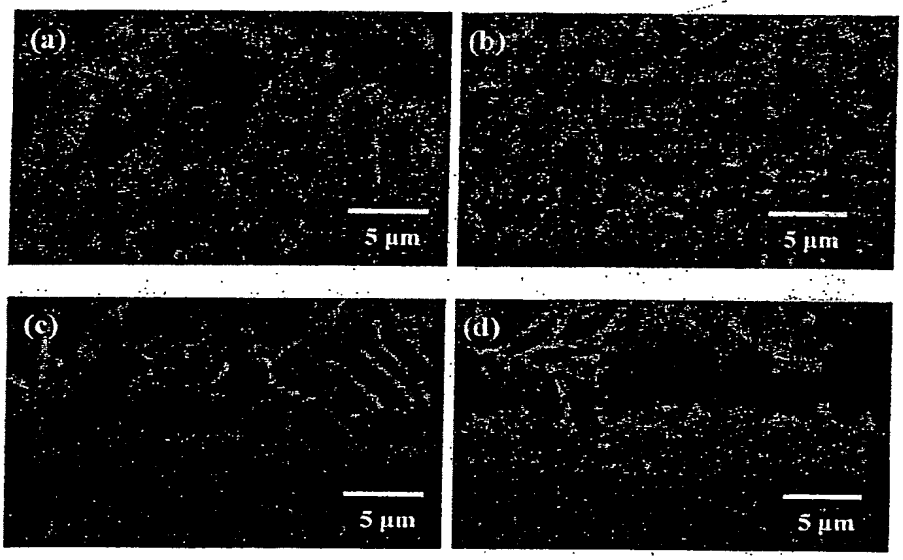


Figure 6.

Fig. 7

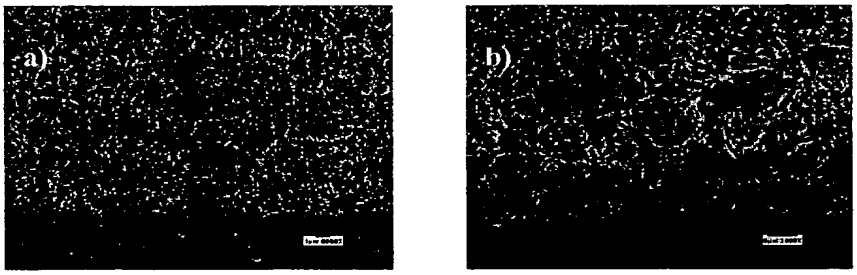


Fig. 8

Fig. 8(a)

Fig. 8(b)

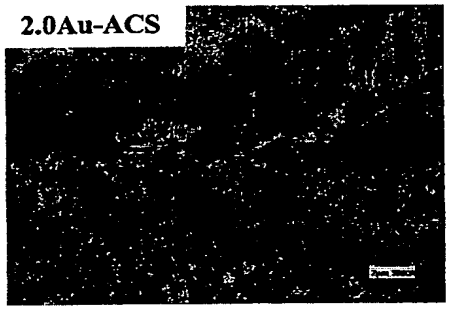
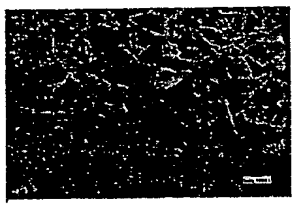


Fig. 9

Fig. 9(a)

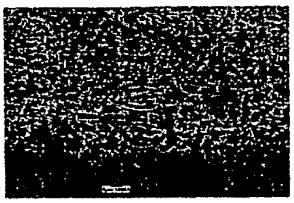


As-prepared

Fig. 9(b)

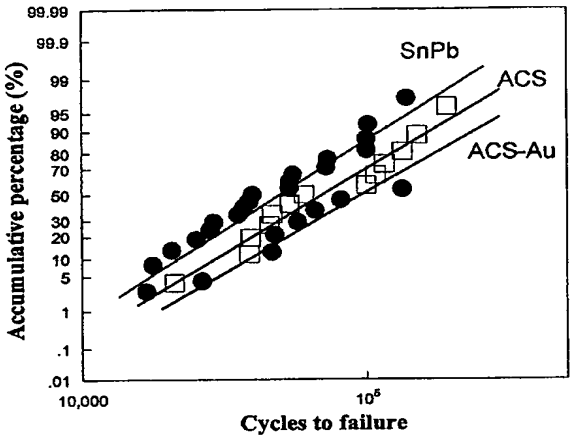
4 days at 165°

Fig. 9(c)



25 days at 165°C

Fig. 10


99.99
99.9
99
95
90
80
70
50
30
20
10
5
1
.1
.01
Accumulative percentage (%)
10,000
10^5
Cycles to failure
SnPb
ACS
ACS-Au